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Title: The Photodetector Timing Program at Fermilab

Abstract: As accelerator based physics advances into new realms of luminosity and searches for rare processes, detector performance must advance along with it. In many cases that means making very fast timing measurements - typically less than 20 picoseconds. Fermilab has been exploring several techniques in fast photodetection, including microchannel plate phototubes and silicon photomultipliers. I will describe several methods for timing measurements at the few picosecond level and show results for time-of-flight measurements in the Fermilab Test Beam Facility, as well as timing measurements in devices planned for the forward region of CMS. Fermilab is collaborating with Argonne National Lab and the University of Chicago's development of an 'ultimate' phototube: the Large Area Picosecond-level Photo Detector (LAPPD), which has the promise of transforming the field of photodetection. Finally, I will describe Fermilab's initial results in using these methods for Time-of-Flight Positron Emission Tomography (TOF-PET).